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(74) Agent and/or Address for Service: Carol P. Greaves Greaves Brewster, Indigo House, Cheddar Business Park, Wedmore Road, CHEDDAR, Somerset, BS27 3EB, United Kingdom		(58) Field of Search: INT CL <sup>7</sup> G01K Other: ONLINE WPI EPODOC JAPIO

(54) Abstract Title: Container with contents temperature indications

(57) A container e.g for beverages comprises a first temperature sensitive area 2 which produces a first visual signal at a first predetermined temperature; and a second temperature sensitive area 8 which produces a second visual signal at a second predetermined temperature, the first and second signals being indicative of the suitability of the containers contents for consumption, during use. A third area 12 and possibly a fourth area are provided to indicate further respective predetermined temperatures. These areas can represent different stages of beverage cooling from "too hot", through "wait", to "ready". Alternatively, they represent respective temperatures suitable for adults, children and babies. The areas are incorporated during manufacture, applied after manufacture, or are labels or sleeves. Indications are colours, pictures, symbols or plain text.

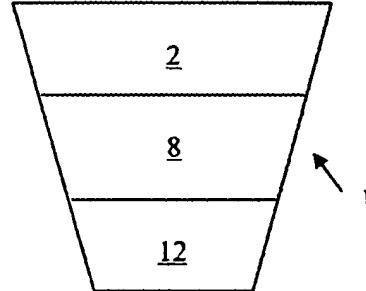


Figure 1a

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

Original Printed on Recycled Paper

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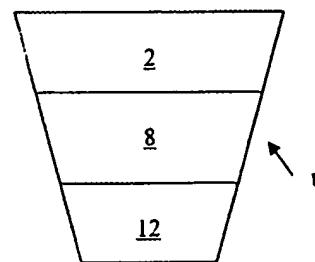


Figure 1a

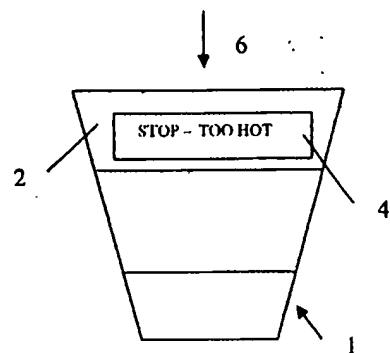


Figure 1b

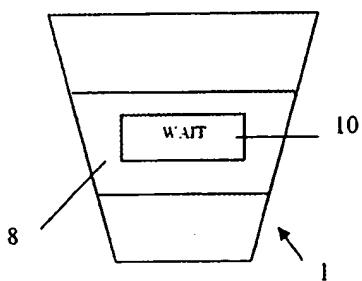


Figure 1c

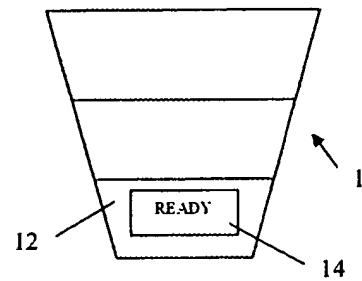


Figure 1d

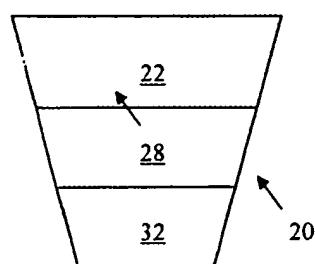


Figure 2a

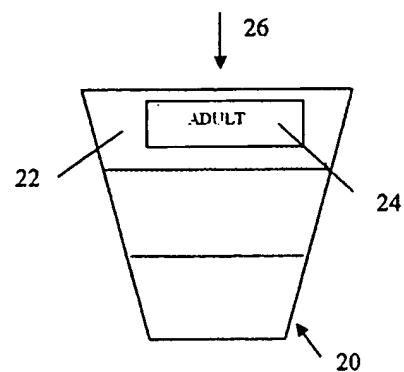


Figure 2b

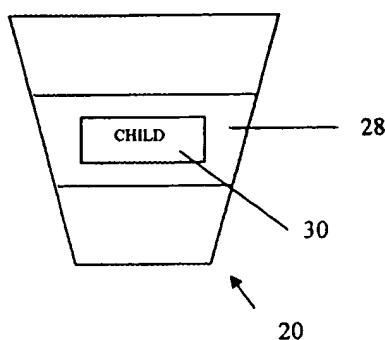


Figure 2c

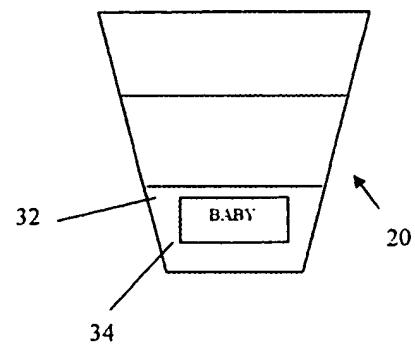


Figure 2d

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CONTAINER

The present invention relates to a container and especially, but not exclusively, to a container for food and drink products, for 5 example, coffee and tea. The container is preferably a safety container, which indicates to a consumer when the food or drink product is at a safe temperature to consume.

Food and drink products are often served to people at undesirable 10 temperatures, which may cause injury or discomfort, for example burns or scalds, to a person consuming the food or drink product.

This is especially the case, in particular, in restaurants and fast food outlets, which in recent years have seen many law suits 15 arising from such burns or scalds.

These law suits have cost these industries large sums of money and have been well publicised in the press and on television. With the number of such cases increasing each year it has become 20 important for industries such as the fast food industry and restaurant industry to protect themselves from being sued.

It is also important that consumers of all ages can protect themselves from harm whenever possible. Any new method of 25 preventing injury from food or drink products, which are too hot or too cold to consume, is therefore desirable.

The best advice to consumers is to allow the item of food or drink to cool or heat to a suitable temperature before 30 consumption but without allowing hot food to become too cool or cold.

However this is an imprecise guide and consumers can easily misjudge the optimum moment to consume hot or cold food or drink.

Also, consumers of different ages have different requirements with regard to the consumption of food. Children for example, cannot eat food at the same hot temperatures which adults can consume their food and drinks. To some extent this may also be 5 true for more elderly people who may be more sensitive to extremes of temperature.

For toddlers and babies this temperature sensitivity is even more exaggerated. It is well known that the temperature of babies and 10 toddlers food must be tested. In normal containers such as cups and the like, this may be achieved by inserting a finger into the food or drink product, or by tasting it. This kind of temperature testing is however unhygienic and may result in, for example, harmful bacteria being transferred to the food product.

15 A container, which can indicate to a consumer when the food or drink product contained therein is at a suitable temperature for consumption by different age groups, is therefore clearly desirable.

20 Presently available containers are available which use thermochromic paints and inks within their walls or lids to indicate whether the temperature of a food product inside the container is hot or cold. This has been done in several ways in 25 the past, for example by comparing a colour change in the thermochromic ink or paint, caused by a change in temperature, to a reference colour on the container thereby indicating the temperature.

30 As used herein, the term "thermochromic paint or ink" refers to any material which can be applied to a container wall or be incorporated within it, which is capable of changing colour when subjected to specific temperatures. For example, those that will change their appearance as temperatures increase or decrease.

35 Thermochromic temperature indicator panels are also included

within the meaning of this term, as are containers which themselves are capable of changing colour.

Other methods have involved using changing colours, logos or 5 symbols which, for example, might reveal the word "hot", when the contents are too hot to consume, with the word gradually fading away as the temperature of the food or drink product drops. An example of such a container can be found in Canadian Patent Application No CA2305, 827

10 Presently available containers have the disadvantage that there are only two signals i.e. "hot" and "not hot" where in reality the food contents will cool or heat up through a range of temperatures, which will be suitable consumption temperatures for 15 some consumers, but not others.

At present however there is no container available, which uses a plurality of thermochromic inks or paints to indicate the suitability of a heated or cooled food or drinks product for 20 consumption by different age groups, over a period of time.

Accordingly, the present invention provides an improvement to known containers for food and drinks products, such as those described above.

25 The invention provides a container comprising:  
a first temperature sensitive area which produces a first visual signal at a first predetermined temperature; and  
a second temperature sensitive area which produces a second 30 visual signal at a second predetermined temperature, the first and second signals being indicative of the suitability of the containers contents for consumption, during use.

As used herein, the term "container" refers to any container 35 capable of containing a food or drink product and should be taken to include any part of a container that is in direct contact with

any food or drink product. Suitably the first and second areas are located in such a part of the container as this will provide a better temperature measure of product.

5 In a preferred embodiment such a container is designed so that it indicates clearly when the optimum temperature range for consumption is reached, enabling patrons of fast food and other catering outlets to see an indication of the temperature of the hot beverage or food and to avoid or minimise the risk of being 10 burnt by consuming items which are too hot.

Suitably the first signal indicates that a product contained within the container, in use, is too hot for consumption and the second signal indicates that a product contained within the 15 container is suitable for consumption.

The container may also further comprise a third temperature sensitive area which produces a third visual signal at a third predetermined temperature.

20 When such a third temperature sensitive area is present, the second signal preferably indicates that a product contained within the container is suitable for consumption by an adult and the third signal indicates that a product contained within the 25 container is suitable for consumption by a child.

The container may however contain more temperature sensitive areas, for example a fourth temperature sensitive area which produces a fourth visual signal at a fourth predetermined 30 temperature. This fourth signal may then indicate that a product contained within the container is suitable for consumption by a baby or toddler.

35 Alternatively, different types of signals, orders of signals or numbers of signals may be desired for different containers and for different temperature ranges. For example if there are three

temperature sensitive areas, the first signal may indicate that a product contained within the container is suitable for consumption by an adult, the second signal indicating that a product contained within the container is suitable for 5 consumption by a child and the third signal indicating that a product contained within the container is suitable for consumption by a baby or toddler.

10 The temperature sensitive areas preferably comprise thermochromic inks, dyes or paints, for example those supplied by CCL Label Inc, Nashua, Hcocolours, Inxink.

15 The temperature sensitive area may be incorporated into the structure of the container or may be applied to the container wall in any suitable manner after manufacture. Alternatively the temperature sensitive area may be in the form of a label or sleeve positioned on the container wall.

20 In the container, the signals and the predetermined temperatures are all preferably different, such that different signals are produced at different temperatures.

25 The thermochromic inks, dyes or paints can be chosen depending on the end use for the container. For example, the first predetermined temperature may be above 140°F, for example from 175 to 200°F, the second predetermined temperature may be between 125 and 150°F and most preferably between 135 and 140°F, the third predetermined temperature is preferably between 100 and 135°F and the fourth predetermined temperature may be between 95 and 105°F 30 degrees.

35 Preferably the signal produced is a colour change but may also be the appearance or disappearance of a picture or symbol. Most preferably the signal involves the appearance and disappearance of plain-language text giving advice on whether or not the consumable item was at a safe temperature for consumption without

risk of burning or scalding. The message to the consumer might give advice such as "STOP", "too Hot to Drink" or "Too Hot to Eat" when it is still very hot. "Wait" when it is a little cooler but may still be too hot for most consumers and "Drink 5 Now" or "Eat Now" when it has reached a safe temperature. The latter preferably appearing as soon as the top of the safe range has been reached and allowing the consumer to enjoy the beverage or food at an enjoyable temperature but without risk of burning or scalding.

10

These signals preferably appear and disappear as a product contained within the container changes temperature, such that at any one time only one signal is visible and indicates the suitability of the food to consumption.

15

The container may be any container capable of containing and contacting a food or drinks product and is preferably a cup, tray or dish. The container may be made of any suitable material, for example, card, paper or plastics material, for example, expanded 20 polystyrene and is most preferably disposable.

The containers may be provided on there own or alternatively maybe provided with a food or drinks product contained therein, such that when the product so-contained, is heated in, for 25 example, in microwave, its warmth and suitability for consumption, particularly by people in different age groups, can be visualised by the signal on the container.

The container most preferably is a food or drinks container 30 incorporating in its body a temperature sensing item which detects whether the food or drink in the container is at a safe or unsafe temperature for consumption and displays on the container at least one message or pictorial or symbolic indication concerning the temperature of the food or drink.

35

This invention is most beneficial as it offers benefits not only to consumers in terms of enhanced safety and enjoyment of food and drink at optimum temperatures. It also provides protection to hot food and drink suppliers who will enjoy a high degree of 5 protection from litigation arising from customers being burnt or scalded by items which are frequently supplied at too high a temperature for safe immediate consumption.

10 The container is intended to apply to a wide range of products used, especially, in the supply of fast food or takeaway food products.

15 In order that the invention may be more fully understood, a preferred embodiment of container, in accordance therewith, will now be described by way of example only and with reference to the accompanying drawings in which:

Figure 1. is a side view of a first embodiment of container;

20 Figure 2. is a side view of a second embodiment of container.

As shown in Figure 1a to 1d, the cup, indicated generally at 1 has a first temperature sensitive area 2 which produces a first 25 visual signal 4 at a first predetermined temperature when a hot drink is added (indicated generally at 6) to the cup 1.

The cup 1 also a second temperature sensitive area 8 which produces a second visual signal 10 at a second predetermined temperature once the contents of the container are beginning to 30 cool.

The cup 1 also has a third temperature sensitive area 12 which produces a third visual signal 14 at a third predetermined temperature which is suitable for consumption of the drink 35 contained within the cup 1. These signals therefore indicate

when the drink is too hot, that it is cooling down and that it is safe for consumption.

Alternatively and as shown in Figures 2a to 2d the cup indicated  
5 generally at 20 may contain different visual signals. The cup shown in Figures 2a to 2b has a first temperature sensitive area 22 which produces a first visual signal 24 at a first predetermined temperature when a hot drink is added (indicated generally at 26) to the cup 20. This signal 24 reads "ADULT" and  
10 indicates to a consumer that the drink held within the cup 20 is at a temperature suitable for an adult to drink.

The cup 20 also has a second temperature sensitive area 28, which produces a second visual signal 30 at a second predetermined  
15 temperature once the contents of the container are beginning to cool. This signal 30 reads "CHILD" and indicates to a consumer that the drink held within the cup 20 is at a temperature suitable for a child to drink.

20 The cup 20 also has a third temperature sensitive area 32 which produces a third visual signal 34 at a third predetermined temperature once the contents of the cup 20 have cooled considerably. This signal 34 reads "BABY" and indicates to a consumer that the drink held within the cup 20 is at a  
25 temperature suitable for a baby or toddler to drink.

Obviously may different types of signals, for example pictures, colours or other wording would fall within the scope of this invention and may be desired for different containers and for  
30 different temperature ranges.

The temperature sensitive areas 2, 8, 12, 22, 28 and 32 are formed from thermochromic inks, dyes or paints which can be incorporated into the structure of the cup 1, 20 or may be  
35 applied to the cup 1, 20 in any suitable manner after manufacture. Alternatively the temperature sensitive area 2, 8,

12, 22, 28 and 32 may be in the form of a label or sleeve positioned on the cup 1, 20.

These signals 4, 10, 14, 24, 30 and 34 appear and disappear as

5 the product contained within the cup 1, 20 changes temperature, such that at any one time only one signal 4, 10, 14, 24, 30 and 34 is visible and indicates the suitability of the food to consumption.

10 The cup 1, 20 is made of any suitable material, for example, card, paper or plastics material, for example, expanded polystyrene and is disposable.

Claims

1. A container comprising, a first temperature sensitive area which produces a first visual signal at a first predetermined temperature; and a second temperature sensitive area which produces a second visual signal at a second predetermined temperature, the first and second signals being indicative of the suitability of the containers contents for consumption, during use.

10

2. A container according to claim 1 wherein the first and second areas are located in such a part of the container as this will provide a better temperature measure of product.

15 3. A container according to claim 2 wherein said part is in direct contact with a food or drink product contained in the container.

4. A container according to claim 1 or 2 wherein the part is a 20 lid for the container.

5. A container according to any preceding claim wherein the first and second signals indicate clearly when the optimum temperature for consumption of any beverage or food held within 25 said container is reached.

6. A container according to any preceding claim wherein the first signal indicates that a product contained within the container, in use, is too hot for consumption and the second 30 signal indicates that a product contained within the container is suitable for consumption.

7. A container according to any preceding claim further comprising a third temperature sensitive area which produces a 35 third visual signal at a third predetermined temperature.

8. A container according to claim 7 wherein, when such a third temperature sensitive area is present, the second signal preferably indicates that a product contained within the container is suitable for consumption by an adult and the third signal indicates that a product contained within the container is suitable for consumption by a child.

9. A container according to claim 7 or 8 further comprising a fourth temperature sensitive area which, when the container is in use, produces a fourth visual signal at a fourth predetermined temperature.

10. A container according to claim 9, wherein the fourth signal indicates that a product contained within the container, in use, is suitable for consumption by a baby or toddler.

11. A container according to any preceding claim wherein the temperature sensitive areas comprise thermochromic inks, dyes or paints.

20 12. A container according to any preceding claim wherein the temperature sensitive areas are incorporated into the structure of the container or are applied after manufacture.

25 13. A container according to any of claims 1 to 11 wherein temperature sensitive areas are in the form of a label or sleeve.

14. A container according to any preceding claim wherein the signals and the predetermined temperatures are different, such 30 that different signals are produced at different temperatures.

15. A container according to any preceding claim wherein the signals produced are colour changes.

16. A container according to any of claims 1 to 14 wherein the signals produced are the appearance or disappearance of a picture or symbol.

5 17. A container according to claim 16 wherein the picture or symbol is plain-language text giving advice on whether or not a consumable item contained within the container was at a safe temperature for consumption without risk of burning or scalding.

10 18. A container according to any preceding claim wherein the signals appear and disappear as a product contained within the container changes temperature, such that at any one time only one signal is visible and indicates the suitability of the food to consumption.

15 19. A container according to any preceding claim comprising card, paper or plastics material.

20 20. A container according to any preceding claim which is disposable.

21. A container substantially as hereinbefore described with reference to the accompanying drawings.

25 22. A container as claimed in any preceding claim further comprising one or more items of food or beverage for heating and consumption, or intended for heating and consumption, located in the container.



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Application No: GB0309896.9

Examiner: Roger Binding

Claims searched: 1-22

Date of search: 7 July 2004

### Patents Act 1977: Search Report under Section 17

#### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular reference
X	1-3, 5-7, 9, 11, 13- 20, 22	DE 29902549 U (TOEPPER KULMBACH), see abstract and drawings.
X	1-3, 5-7, 9, 11, 13- 15, 20	EP 0997717 A (CESBRON)
X	1-3, 5, 11, 13, 14, 16, 18-20	GB 2374583 A (JACKEL INTL)
X	1-7, 11- 20, 22	US 2002/0167989 A (RUSSO)
X	1-7, 11, 13, 14, 16-18, 20	US 2002/0097778 A (DRUAR)
X	1-3, 5-7, 9, 11-14, 16, 17, 22	US 2002/0097777 A (RONCI), see especially Fig 2.
X	1-3, 5-7, 9, 11, 13- 15, 20	US 5738442 A (FRITZ)
X	1-7, 9, 12-15, 22	US 4933525 A (MOBIL OIL)
X	1-7, 11- 14, 19, 20, 22	WO 2002/055405 A (MILLER), see especially Fig 5 and paras. 0048, 0049, 0054.
X	1-3, 5-7, 11, 13-	WO 01/88483 A (IN2WINE)



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**Categories:**

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

**Field of Search:**

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>W</sup> :

Worldwide search of patent documents classified in the following areas of the IPC<sup>07</sup>

G01K

The following online and other databases have been used in the preparation of this search report

Online WPI EPODOC JAPIO